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Forest Insect Control (Test of virus of Douglas-fir tussock moth)

During the week of January 25-29 we visited the Modoc National Forest in northern California to evaluate the possibility of conducting virus tests there in 1965 against the Douglas-fir tussock moth. We also visited the forest insect laboratory at Hat Creek on the Lassen National Forest, to determine its suitability as a temporary field laboratory for the virus work. An itinerary of the trip was as follows.

Monday, January 25 - Wright drove to Corvallis where he picked up Thompson. They met Boyd Wickman of the PSW Station at the Medford Airport and traveled to Shasta City to spend the night.

Tuesday, January 26 - The party drove to Hat Creek, where laboratory facilities and X-ray equipment were examined; in the pm. drove to the Stowe reservoir tussock moth infestation in the Warner Mountains near Cedarville, ending up in Alturas; met Roy Blomstrom, John Pierce, and Bruce Roettgering from the R-5 Division of Forest Pest Control.

Wednesday, January 27 - Visited the Modoc supervisor's office where we met Ken Smith, Timber Management officer for the Modoc. Party traveled to the Roney Flat infestation area (some 4 miles by snow-cat from the highway); made reconnaissance of the area, and collected egg samples along cross-country strips; returned to Alturas.

Thursday, January 28 - Discussed the proposed project with Supervisor Bill Cooperrider of the Modoc; collected some 1000 tussock moth egg masses at Stowe Reservoir area; visited ranger Carl Westrate of the Big Valley Ranger District at Adin concerning possible facilities for field crews and project laboratory; drove to Bend, Oregon.

Friday, January 29 - Drove to Corvallis and Portland.

Following are conclusions, discussions, and highlights of the trip.

Description of the Roney Flats Area and Infestation.

The Roney Flat infestation is in a mixed white fir - ponderosa pine - juniper forest on generally north and east-facing slopes of an unnamed mountain in T40N, R9E. The elevation ranges from about 5200 feet at the bottom of the mountain to approximately 6200 feet at the top in a distance of about 1-1/2 miles.

The pine stand was selectively logged about 1940; a sizeable volume of mature trees remain on the area. Most of the fir is 10 to 40 feet tall, and is generally rather open-grown, particularly near ridge tops where it is mixed with juniper.

Degree of infestation within the 2,280-acre boundary mapped by R-5 surveys varies from very heavy (trees completely stripped) to no defoliation. It appeared from three cruise lines we ran across the area that much of it should be rated as moderate to heavy in damage intensity. Time did not permit an adequate assessment of the amount of area in the various damage classes. It appeared that a considerable part of the mapped area is too light for study purposes.

Egg masses were readily collected in the moderate to heavily defoliated areas; a few were found in very heavy (trees stripped) areas, but none in very light or intermingled non-defoliated stands. No counts were made but it appeared that new egg masses outnumbered old ones considerably, except in the very heavily defoliated areas.

A large number of unemerged pupae were noted. Dr. Don Dahlsten of the University of California reported a high degree of pupal parasitism in the area in 1964.

The area is bounded by a good forest access road, but no roads bisect it. It seemed however, that temporary jeep roads could be pioneered to permit access by field crews.

Aerial photos of the area were studied but found to be too small scale and too old to be very useful. They do show non-forested type, particularly on ridge tops, which would have to be excluded from consideration for spray plots.

Since returning to Portland, the infested area has been transferred to a large scale map and an attempt made to superimpose 22.5-acre spray plots. Although exact boundaries of the infestation, the fir type, and non-forest openings are unknown, it was immediately apparent that the area is too small for the 24 spray plots proposed in the preliminary prospectus. It is highly questionable that even 12 spray plots, plus 3 control plots, could be accommodated. Unless plot size can be reduced to about 10 acres it appears the area is too small. Intensive survey of the area is needed to accurately define the useable area.

<u>The Fredonyer Peak Area as a Possible Test Site</u>.

This area, considered as a possible alternative to the Roney Flats Area, because of its high egg population, was not visited but was discussed with Blomstrom, Pierce, and ranger Carl Westrate. It is a very remote area; it was estimated that one could not get within 40 miles of it by road at this time of year.

Roy Blomstrom mentioned that the Bureau of Land Management, which manages about 70 percent of the area, is much interested in the tussock moth problem. He speculated that BLM might be willing to go into the area by helicopter this winter and collect egg mass samples for virus testing. Roy will be seeing BLM foresters on Thursday, Feb. 4, and will recommend that egg masses be collected, if feasible.

Ranger Westrate at Adin generally is familiar with the Fredonyer Peak area. He stated that it is high (6,000 to 7,000') steep country and is inaccessible much of the year. There are no towns or communities suitable for work camps for perhaps some 50 miles. It would appear that tent camps would need to be set up.

Field Headquarters and Laboratory.

Two locations were considered---Hat Creek Ranger Station and the town of Adin. Boyd Wickman, in charge of the PSW forest insect field base at Hat Creek, showed us the space and generously offered to share it with us. His space is well developed and maintained, but is limited in area. Others besides Wickman will be using the facilities this summer; accordingly, it would seem unreasonable that Wickman attempt to find room for us.

Hat Creek is some 60 miles from the proposed test area at Roney Flats. Transporting many insect collections this distance would be inconvenient, expensive, and hazardous to the insects---particularly in midsummer when temperatures commonly reach 100 degrees or more.

Facilities at the town of Adin for housing personnel and establishing a field laboratory appeared quite good. Adin is some 12 miles from the spray area, and is headquarters for the Big Valley Ranger District, on which is located the Roney Flats area. Ranger Westrate showed us two sleeping facilities at the ranger station. Two or three men could be accommodated in a small building behind the office; four or five men in the dormitory across the road. Westrate has been undecided whether to operate a government mess this year. If we would be using it for extended periods, he would probably do so. Cost of the project would be much reduced by using these government facilities.

We visited with a Mrs. Canarr who operates the Juniper Tree Motel, the only one in Adin. It is a modern and very good facility. Mrs. Canarr, who has a sizeable Forest Service clientele, said she could provide a maximum of four units for continuous use---housing perhaps 8 men.

Opportunity for using an abandoned high school for a field laboratory appear good. The school is vacant because of consolidation of Adin pupils with those at another town. Various rooms of the building are being remodeled and used for miscellaneous village activities. Mrs. Canarr is a member of the committee developing the facilities; she said they would be happy to rent space to us. An empty chemistry laboratory and several class rooms would be available. Unfortunately, none of them are basement rooms; presumably portable window air conditioners would provide adequate temperature control.

Project Administration.

We discussed a wide variety of matters with Blomstrom, Pierce, and Roettgering, as follows:

1. Personnel - Blomstrom said he was prepared to employ 5 seasonal men that could be assigned to the project for its duration. One man, Bob Pinger, is a biology major that has worked for R-5 previously. He is well regarded and could serve as a crew leader. The four other men would be students recruited from entomology and forestry schools. The men would be employed through the Modoc forest.

   Thompson stated that he, with two assistants, would assist in designing the pathological phases of the study, and handle the laboratory work concerned with evaluating the incidence of virus before and after spraying.

   Wright would supply an entomologist, aided by two assistants, to assist in designing the entomological phases of the study, sample insects in the field, supervise technical aspects of plot installation, and assess spray results.

   Blomstrom and assistants would contract for the spraying, assemble spray facilities, and supervise application of the spray.

2. Costs - It was agreed that detailed costs and apportionments for the project should be worked out at a later date. It appeared that existing funds for financing the FY '65 work probably were largely available at PNW and R-5. Funds for FY 1966, when the bulk of expenditures would occur, probably would need to be requested from the Washington office.

3. Spray contracting - It appeared that cost of the flying would be less than $2500, hence could be contracted directly by the Modoc N.F. Blomstrom said the Modoc contracted a helicopter for fire control in 1964; if this was done again in 1965 it was quite possible the helicopter could be used to apply the spray. Later discussion with supervisor Cooperrider confirmed this possibility. It was recognized that there might be some conflict in use if a forest fire should occur at the time of spraying.

Miscellaneous Planning.

A number of items were discussed concerning details of the test, organization, etc. as follows:

1. ARS participation - Blomstrom mentioned that ARS would be doing some grasshopper spraying in the Modoc area. He suggested that we might work with Dick Thompson and Jim Dutton from the Sacramento office on technical details of the job, and possibly the actual spraying. Blomstrom hoped to see one of these men soon.

Wright mentioned that ARS spraying specialists at Forest Grove, Oregon, were interested in cooperating with the Forest Service on the technical aspects of spraying. Pierce stressed that he could use help on calibrating aircraft, and methods of flushing spray systems to insure decontamination from previously used chemicals.

2. Marking spray plot corners - This is expected to be one of the most difficult jobs---particularly in view of the overstory of large pines in the proposed spray area. It was learned from Wickman that the Missoula Equipment Development Center will probably assist the Pesticide Screening project in 1965 on this problem. It was recommended that we make our needs known to the Missoula group and to George Downing of the screening project.

3. Use of Roney Flat Area by Dahlsten, Univ. of Calif. - Dr. Dahlsten made some studies of parasitism in 1964. He would like to use buffer zones between spray plots for study in 1965 if possible. It was agreed that Dahlsten should be invited to continue his work, but pointing out to him the hazards of contamination by sprayed virus.

4. Timing of Events - Rough estimates of times for important events were made:

   a. Sample of egg collections made at Roney Flat by Ralph Hall of R-5 last fall are now hatching at Corvallis. The incidence of virus in them should be known by about March 1.

   b. The egg masses collected during the trip (on January 27) were placed in rearing on January 29. We should know by March 15 if virus is present, and from what collecting points.

   c. Intensive aerial sketch mapping should be done on the Roney Flat and Fredonyer Peak Areas to define infested boundaries and acreages as accurately as possible---to determine adequacy for the virus spray tests. This should be done by March 1 so that the two factors determining whether the tests will be made are both known---i.e. adequacy of the area(s) and incidence of virus.

   d. Egg hatch of the tussock moth is highly variable; the best guess is about June 15 at Roney Flats, and later by 10 days or so at Fredonyer Peak. According to Wickman the eggs hatched after July 1 last year at Roney Flat. It was a very late year.

   e. The best estimate of time of spray application against late 3rd or early 4th instar larvae is about 3 weeks after egg hatch---perhaps July 15 at Roney Flat.

5. Summary

The Roney Flat area was examined, but inadequately. Infestation characteristics appear good for the virus tests, but the area is probably too small to permit desired treatment replication. Further definition of infestation boundaries is needed. It is hoped this can be done by mid-March, when laboratory rearings will have determined whether native virus is present in the Roney Flat infestation.

In the event that the Roney Flat area is unsuitable, consideration should be given to conducting the tests at Fredonyer Peak. Possibly the tests could be split between the two areas. The Bureau of Land Management should be encouraged to collect overwintering egg masses soon, to be sent to the Corvallis laboratory for rearing. The area should also be flown, the infestation mapped as accurately as possible, and general suitability determined.

Arrangements for administering the tests jointly with R-5 Pest Control seem quite workable. Planning and conduct of the tests would be done together, with PNW taking responsibility for design and technical supervision; and R-5 providing a 5-man seasonal crew for the field work, and carrying out the actual spraying.

The town of Adin appears to be a suitable headquarters if the Roney Flat area is used. Possible facilities for the Fredonyer Peak Area were not explored.

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